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What is claimed is:

1. An electrochemical storage device, comprising:

a plurality of electrochemical cells arranged in a spaced apart relationship, each of the electrochemical cells comprising opposing first and second planar surfaces and being subject to volumetric changes during charge and discharge cycling; and

a unitary cooling bladder formed of a conformable thermally conducting material and having an inlet port and an outlet port, the cooling bladder amenable to assuming a substantially flat shape when in an uninstalled configuration and, in an installed configuration, conformable to maintain contact with at least the first planar surface or the second planar surface of each of the electrochemical cells during the volumetric changes, a heat transfer medium passing between the inlet and outlet ports to control an operating temperature of the electrochemical cells.

2. The device of claim 1, wherein the cooling bladder comprises a continuous hollowed interior within which the heat transfer medium passes.

3. The device of claim 1, wherein the cooling bladder comprises a plurality of flow channels within which the heat transfer medium passes.

4. The device of claim 1, wherein the cooling bladder covers substantially all of a surface area of each of the cells.

5. The device of claim 1, wherein the cooling bladder comprises a support arrangement that inhibits restriction of heat transfer medium flow at cooling bladder bend locations.

6. The device of claim 5, wherein the support arrangement is located on an outer surface of the cooling bladder at the cooling bladder bend locations.

7. The device of claim 5, wherein the support arrangement is located within the cooling bladder at the cooling bladder bend locations.

8. The device of claim 1, wherein the cooling bladder comprises a porous filler material disposed within the cooling bladder.

9. The device of claim 1, wherein the cooling bladder comprises a porous filler material disposed at cooling bladder locations subject to bending.

10. The device of claim 1, wherein the cooling bladder comprises thickened sections provided at cooling bladder locations subject to bending.

11. The device of claim 1, wherein the cooling bladder comprises an interior compartment within which the heat transfer medium passes between the inlet port and the outlet port in a unidirectional manner.

12. The device of claim 1, wherein the cooling bladder comprises a plurality of compartments through which the heat transfer medium passes.

13. The device of claim 1, wherein the cooling bladder comprises a first interior compartment and a second interior compartment, the transfer medium passing within the first interior compartment in a direction opposing that of the transfer medium passing within the second interior compartment.

14. The device of claim 1, wherein the conformable thermally conductive material comprises a single material layer.

15. The device of claim 1, wherein the conformable thermally conductive material comprises a plurality of material layers.

16. The device of claim 1, wherein the conformable thermally conductive material comprises a metallic layer disposed between a first polymer layer and a second polymer layer.

17. The device of claim 1, wherein the conformable thermally conductive material of the cooling bladder has a thickness of less than about 150 mils.

18. The device of claim 1, wherein the cooling bladder and the heat transfer medium constitute less than about 50 % by weight or volume of a total aggregate weight or volume of the cells, cooling bladder, and heat transfer medium.

19. The device of claim 1, wherein the plurality of electrochemical cells are arranged to form a plurality of cell sets, each of the cell sets provided with one of a plurality of the cooling bladders, such that an operating temperature of electrochemical cells of each of the cell sets is controlled by at least one of the plurality of cooling bladders.

20. The device of claim 1, wherein the plurality of electrochemical cells are arranged to form a cell stack, and the cooling bladder controls the operating temperature of the cell stack such that a temperature difference as measured between any two cells of the cell stack does not exceed 5 degrees Celsius.

21. The device of claim 1, wherein the plurality of electrochemical cells are arranged to form a cell stack, and the cooling bladder controls the operating temperature of the cell stack such that a temperature difference as measured between any two points on either the first or second planar surface of an individual cell does not exceed 5 degrees Celsius.

22. The device of claim 1, wherein the plurality of electrochemical cells are arranged to form a cell stack, and the cooling bladder controls the operating temperature of the cell stack such that a temperature difference as measured between any two cells of the cell stack or between any two points on either the first or second planar surface of an individual cell does not exceed 2 degrees Celsius.

23. The device of claim 1, wherein the cooling bladder conforms to a serpentine configuration to contact the respective first and second planar surfaces of each of the electrochemical cells.

24. The device of claim 1, wherein:

each of the plurality of electrochemical cells comprises first, second, third, and fourth edges, the first edge opposing the second edge and the third edge opposing the fourth edge;

the first and second edges of each electrochemical cell electrically couples to respective electrical conductors for conducting current into and out of each of the electrochemical cells; and

the cooling bladder contacts respective third and fourth edges and respective first and second planar surfaces of each of the electrochemical cells.

25. The device of claim 1, wherein the heat transfer medium comprises water.

26. The device of claim 1, wherein the heat transfer medium comprises a mixture of water and ethylene glycol.

27. The device of claim 1, wherein a temperature of the heat transfer medium entering the inlet port of the cooling bladder is substantially constant.

28. The device of claim 1, wherein the operating temperature of the electrochemical cells ranges between about 20 degrees Celsius and about 130 degrees Celsius.

29. The device of claim 1, further comprising a housing within which the plurality of electrochemical cells and the cooling bladder are situated, the housing comprising a positive terminal and a negative terminal each coupled to the electrochemical cells, the housing further comprising an inlet aperture for providing access to the inlet port of the cooling bladder and an outlet aperture for providing access to the outlet port of the cooling bladder.

30. The device of claim 1, further comprising a housing within which the plurality of electrochemical cells and a plurality of the cooling bladders are situated, the housing comprising a positive terminal and a negative terminal each coupled to the electrochemical cells, the housing further comprising at least one inlet aperture for providing access to an inlet port of each of the cooling bladders and at least one outlet aperture for providing access to an outlet port of each of the cooling bladders.

31. The device of claim 1, wherein the electrochemical cells comprise lithium cells or nickel metal hydride cells.

32. An electrochemical storage device, comprising:

a plurality of electrochemical cells arranged in a spaced apart relationship, the electrochemical cells comprising opposing first and second planar surfaces, the electrochemical cells subject to volumetric changes during charge and discharge cycling; and

a <u>unitary</u> cooling bladder formed of a conformable thermally conductive material, the cooling bladder <u>amenable to assuming a substantially flat shape when in an uninstalled configuration and, in an installed configuration,</u> conformable to contact at least the respective first planar surface or second planar surface of each of the electrochemical cells, a heat transfer medium passing within the cooling bladder to control an operating temperature of the electrochemical cells, the thermally conductive material of the cooling bladder having a strength sufficient to hold a pressure that

maintains the electrochemical cells in a state of compression during charge and discharge cycling.

33. The device of claim 32, wherein the cooling bladder comprises a plurality of flow channels within which the heat transfer medium passes.

34. The device of claim 32, wherein the cooling bladder comprises a support arrangement that inhibits restriction of heat transfer medium flow at cooling bladder bend locations.

35. The device of claim 34, wherein the support arrangement is located on an outer surface of the cooling bladder at the cooling bladder bend locations.

36. The device of claim 34, wherein the support arrangement is located within the cooling bladder at the cooling bladder bend locations.

37. The device of claim 32, wherein the cooling bladder comprises a porous filler material disposed within the cooling bladder.

38. The device of claim 32, wherein the cooling bladder comprises thickened sections provided at cooling bladder locations subject to bending.

39. The device of claim 32, wherein the cooling bladder comprises a plurality of compartments through which the heat transfer medium passes.

40. The device of claim 32, wherein the conformable thermally conductive material comprises a single material layer.

41. The device of claim 32, wherein the conformable thermally conductive material comprises a plurality of material layers.

42. The device of claim 32, wherein the conformable thermally conductive material of the cooling bladder has a thickness of less than about 150 mils.

43. The device of claim 32, wherein the plurality of electrochemical cells are arranged to form a plurality of cell sets, each of the cell sets provided with one of a plurality of the cooling bladders, such that an operating temperature of electrochemical cells of each of the cell sets is controlled by at least one of the plurality of cooling bladders.

44. The device of claim 32, wherein the plurality of electrochemical cells are arranged to form a cell stack, and the cooling bladder controls the operating temperature of the cell stack such that a temperature difference as measured between any two cells of the cell stack does not exceed 5 degrees Celsius.

45. The device of claim 32, wherein the plurality of electrochemical cells are arranged to form a cell stack, and the cooling bladder controls the operating temperature of the cell stack such that a temperature difference as measured between any two points on either the first or second planar surface of an individual cell does not exceed 5 degrees Celsius.

46. The device of claim 32, wherein the cooling bladder conforms to a serpentine configuration to contact the respective first and second planar surfaces of each of the electrochemical cells.

47. The device of claim 32, wherein:

each of the plurality of electrochemical cells comprises first, second, third, and fourth edges, the first edge opposing the second edge and the third edge opposing the fourth edge;

the first and second edges of each electrochemical cell electrically couples to respective electrical conductors for conducting current into and out of each of the electrochemical cells; and

the cooling bladder contacts respective third and fourth edges and respective first and second planar surfaces of each of the electrochemical cells.

48. The device of claim 32, wherein the operating temperature of the electrochemical cells ranges between about 20 degrees Celsius and about 130 degrees Celsius.

49. The device of claim 32, further comprising a housing within which the plurality of electrochemical cells and the cooling bladder are situated, the housing comprising a positive terminal and a negative terminal each coupled to the electrochemical cells, the housing further comprising an inlet aperture for providing access to the inlet port of the cooling bladder and an outlet aperture for providing access to the outlet port of the cooling bladder.

50. The device of claim 32, further comprising a housing within which the plurality of electrochemical cells and a plurality of the cooling bladders are situated, the housing comprising a positive terminal and a negative terminal each coupled to the electrochemical cells, the housing further comprising at least one inlet aperture for providing access to an inlet port of each of the cooling bladders and at least one outlet aperture for providing access to an outlet port of each of the cooling bladders.

51. The device of claim 32, wherein the electrochemical cells comprise lithium cells or nickel metal hydride cells.

52. A method of providing cooling within an electrochemical storage device, comprising:

providing a plurality of electrochemical cells arranged in a spaced apart relationship, each of the electrochemical cells comprising opposing first and second planar surfaces and subject to volumetric changes during charge and discharge cycling;

providing a unitary ~~conformable~~, thermally conductive cooling bladder such that the cooling bladder can assume a substantially flat shape when in an uninstalled configuration and, in an installed configuration, is conformable so as to maintains contact with at least the first planar surface or the second planar surface of each of the electrochemical cells during the volumetric changes; and

passing a heat transfer medium through the cooling bladder to control an operating temperature of the electrochemical cells.

53. The method of claim 52, further comprising pressurizing the cooling bladder to maintain the electrochemical cells in a state of compression during cell charge and discharge cycling.

54. The method of claim 52, wherein passing the heat transfer medium further comprises passing the heat transfer medium through the cooling bladder in a unidirectional manner.

55. The method of claim 52, wherein passing the heat transfer medium further comprises passing the heat transfer medium through a plurality of compartments provided within the cooling bladder.

56. The method of claim 52, further comprising supporting the cooling bladder at cooling bladder bend locations to inhibit restriction of heat transfer medium flow at the cooling bladder bend locations.

57. The method of claim 56, wherein supporting the cooling bladder further comprises using a porous filler material within the cooling bladder to support the cooling bladder at the cooling bladder bend locations.

58. The method of claim 52, wherein the plurality of electrochemical cells are arranged to form a plurality of cell sets, each of the cell sets provided with one of a plurality of the cooling bladders, further wherein passing the heat transfer medium comprises passing the heat transfer medium through each of the cooling bladders to control an operating temperature of the electrochemical cells of each of the cell sets.

59. The method of claim 52, wherein the plurality of electrochemical cells are arranged to form a cell stack, further wherein passing the heat transfer medium comprises passing the heat transfer medium through the cooling bladder to control the operating temperature of the cell stack such that a temperature difference as measured between any two cells of the cell stack does not exceed 5 degrees Celsius.

60. The method of claim 52, wherein the plurality of electrochemical cells are arranged to form a cell stack, further wherein passing the heat transfer medium comprises passing the heat transfer medium through the cooling bladder to control the operating temperature of the cell stack such that a temperature difference as measured between any two points on either the first or second planar surface of an individual cell does not exceed 5 degrees Celsius.

61. The method of claim 52, wherein the heat transfer medium comprises water or a mixture of water and ethylene glycol.

62. The method of claim 52, wherein passing the heat transfer medium comprises passing the heat transfer medium at a substantially constant temperature into the cooling bladder.

63. The method of claim 52, wherein the operating temperature of the electrochemical cells ranges between about 20 degrees Celsius and about 130 degrees Celsius.

64. The method of claim 52, wherein the electrochemical cells comprise lithium cells or nickel metal hydride cells.

65. The method of claim 52, further comprising providing a housing within which the plurality of electrochemical cells and the cooling bladder are situated, the housing comprising a positive terminal and a negative terminal each coupled to the electrochemical cells, the housing further comprising an inlet aperture for providing access to the inlet port of the cooling bladder and an outlet aperture for providing access to the outlet port of the cooling bladder, further wherein passing the heat transfer medium comprises passing the heat transfer medium through the inlet aperture of the housing, the inlet and outlet ports of the cooling bladder, and the outlet aperture of the housing.

66. The method of claim 52, further comprising providing a housing within which the plurality of electrochemical cells and a plurality of the cooling bladders are situated, the housing comprising a positive terminal and a negative terminal each coupled to the electrochemical cells, the housing further comprising at least one inlet aperture for providing access to an inlet port of each of the cooling bladders and at least one outlet aperture for providing access to an outlet port of each of the cooling bladders, further wherein passing the heat transfer medium comprises passing the heat transfer medium through the at least one inlet aperture of the housing, the inlet and outlet ports of the respective cooling bladders, and the at least one outlet aperture of the housing.